

AIR SEARCH FOR A MISSING PERSON



OPR: TORCH LIGHT DOCTRINE TEAM
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Supersedes: Unnumbered paper by LtCol Michael Curry entitled “Air Search for a Missing Person” dated 1 November 1988.

This staff paper proposes a method for employing fixed wing and rotary wing aircraft in coordination with ground searchers in missing person search operations. This paper is neither official policy nor doctrine. The paper is an input to the policy and/or doctrine generation process.

SUMMARY OF REVISIONS

Changed original paper format to conform to Torch Light Staff Paper format and added paragraph four.

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1.0 Background

1.1 General.

The Civil Air Patrol is often called upon to help an agency locate a missing person. The assistance CAP provides may include air search assets, air search management, ground search assets, and help with search planning. Although CAP always supports another agency in missing person searches, we often manage all air operations for the search. Even when we do not manage the air search function, CAP must still provide a command and control (headquarters) element to control our resources. We must also provide guidance to the controlling agency on how to employ our aircraft and crews. When CAP does manage the air search, we often control both fixed wing CAP aircraft and rotary wing aircraft and crews supplied by other agencies. This paper describes a method for employing fixed wing and rotary wing aircraft in a manner that takes advantage of the strengths of each type of asset. This method also allows the search manager to perform an effective missing person air search in a minimum amount of time.

1.2 Fixed Wing Aircraft

1.2.1 Advantages. Fixed wing aircraft can search large areas quickly and, since most CAP aircraft carry a minimum of four hours of fuel on board, have excellent search endurance. They are also inexpensive to operate (typically less than \$60.00 per hour).

1.2.2 Disadvantages. Unfortunately the high search speed of fixed wing aircraft makes it difficult for the crew to detect a small target such as a person, especially in heavy ground cover. Also, when a fixed wing crew sights a possible target, the aircraft must circle the sighting for better identification -- a stressful and sometimes dangerous maneuver.

1.2.3 Optimum Use. Therefore the best use for fixed wing aircraft is for searching relatively large open areas quickly.

1.3 Helicopters

1.3.1 Advantages. Rotary wing aircraft can search an area very slowly, returning an excellent probability of detection, even when searching for a small target. They can also hover over a location to verify a sighting. Rescue capable helicopters have the ability to begin the rescue and/or evacuation of the subject soon after a find.

1.3.2 Disadvantages. The helicopter has a relatively limited endurance which, coupled with its slow search speed, results in a small amount of area searched per sortie. Too, helicopters are expensive to operate (military helicopters cost at least \$2600.00 per hour). And there is a shortage of helicopters with trained search crews.

1.3.2 Optimum Use. The best use for helicopters, then, is for searching small, high probability areas, especially those areas not easily searched by fixed wing aircraft.

2.0 Method

2.1 General Approach

The steps below outline the method for employing helicopters and fixed wing aircraft together in missing person search.

2.1.1 Segment the search area. Divide the search area into 1 RCC grid quadrant-sized pieces (7.5 minutes by 7.5 minutes).

2.1.2 Produce quadrant maps. Print or copy detailed maps of each quadrant to be searched on a single sheet. Maps should be at a scale of 1:75,000 or tighter and should have a distance rule printed on the sheet.

2.1.3 Fixed wing search. Have fixed wing aircraft search each quadrant, checking open areas and marking on the map areas that the crew cannot adequately see.

2.1.4 Helicopter search. Have the helicopter(s) search the same quadrants searched by the fixed wing aircraft using the maps that the fixed wing crews marked. The helicopters should concentrate on those areas marked by the fixed wing crew as difficult to search. Have the helicopter crew(s) further mark the maps with the areas that they cannot adequately see.

2.1.5 Ground search. Have the appropriate agency ground search the areas marked by the helicopter crew(s).

2.2 Segmenting the Search Area

2.2.1 If the subject or incident profile produces a large search area, then divide the area into standard RCC grid quadrants. However, since most subjects are found within three miles of the point last seen (PLS), the maximum probability area (and therefore the primary search area) is normally a circle with a radius of three miles. In this case, make the primary air search area a box seven nautical miles on a side and centered on the PLS. If necessary, adjust the boundaries of the air search area so that they fall on convenient GPS/LORAN coordinates.

2.2.2 After segmenting the search area, produce single sheet maps of each search “grid”. These can be made by photocopying a portion of a county map, photocopying and enlarging a portion of a Gazetteer® page, or printing a map of the area using mapping software such as DeLorme® Street Atlas USA. (See figure 1.) A seven and one-half minute topographical map (scale 1:24,000) could be used if the search area is divided into standard RCC quadrants. As stated above, maps should be at a scale of 1:75,000 or tighter and should have a distance rule printed on the sheet.

2.2.3 If using non-RCC search grids, the search manager may wish to pre-calculate the GPS/LORAN coordinates for the end points of each track for the fixed wing aircraft searches.

2.3 Fixed Wing Aircraft

2.3.1 Select an experienced aircrew with at least two observers. Brief the crew on the subject’s description. However, since many subjects remove clothing and often curl up and lie down, the crew should not rely on clothes coloring to identify the subject. Brief the crew to search for evidence of the subject’s passage (trampled brush, discarded clothing, etc.) not just the subject.

2.3.2 Assign sorties at 500 to 700 feet AGL with one-half nautical mile track spacing and a search speed of 80 to 100 knots. Normally assign north-south tracks, unless lighting conditions permit and other conditions warrant east-west tracks.

2.3.3 Issue the crew the map for their search. Confirm that one observer’s job is to mark difficult to see areas and signs of the subject’s passage on the map. Provide the crew with a highlighter pen for this purpose. Brief the crew that on finding the subject they must determine the subject’s GPS/LORAN coordinates and be prepared to guide a ground team or rescue helicopter into the site. If they will guide in a helicopter, assign the crew a safe cover altitude at which they will orbit while directing the helicopter.



2.4

Helicopters

2.4.1 Select rotary wing resources in the following order.

2.4.1.1 Military search and rescue helicopters and crews. Request these through AFRCC. The CAP search manager and the controlling agency Incident Commander usually must justify this request to the AFRCC controller.

2.4.1.2 Other military helicopters and crews. The same channels and justifications apply as in military SAR helicopters.

2.4.1.3 Locally provided (usually sheriff hired) helicopter with SAR trained crew. Try to determine the crew's level of training and experience.

2.4.1.4 Use news or other helicopters only as a last resort. Place trained observers and a SAR trained pilot in the aircraft with the helicopter's normal pilot.

2.4.2 Brief the crew on the subject's description. However, since many subjects remove clothing and often curl up and lie down, the crew should not rely on clothes coloring to identify the subject. Brief the crew to search for evidence of the subject's passage (trampled brush, discarded clothing, etc.) not just the subject.

2.4.3 Issue the crew the map marked by the fixed wing aircrew. (See figure 2.) Assign the helicopter crew to search those areas marked on the map and to mark areas which they cannot easily see for later ground search. Issue the crew a highlighter pen of a different color than that used by the fixed wing crew. Determine the search speed and altitude with the helicopter crew. This will vary depending upon the type of helicopter, the terrain, and the crew's experience.

2.4.4 Select a radio frequency available to the helicopter, the CAP headquarters, the CAP aircraft, and if possible, CAP ground teams. 123.1 MHz usually works well when using non-CAP air assets. Brief all air and ground units on call signs, coordination frequency, and code words.

2.4.5 Brief the crew that on finding the subject they must determine the subject's GPS/LORAN coordinates and be prepared to guide a ground team into the site. Brief the crew on how to contact the ground team. If the helicopter is rescue capable, brief the crew on the supported agency's rescue and evacuation plan. Coordinate the method for guiding the helicopter into a fixed wing sighting with the fixed wing crew before launching either aircraft.

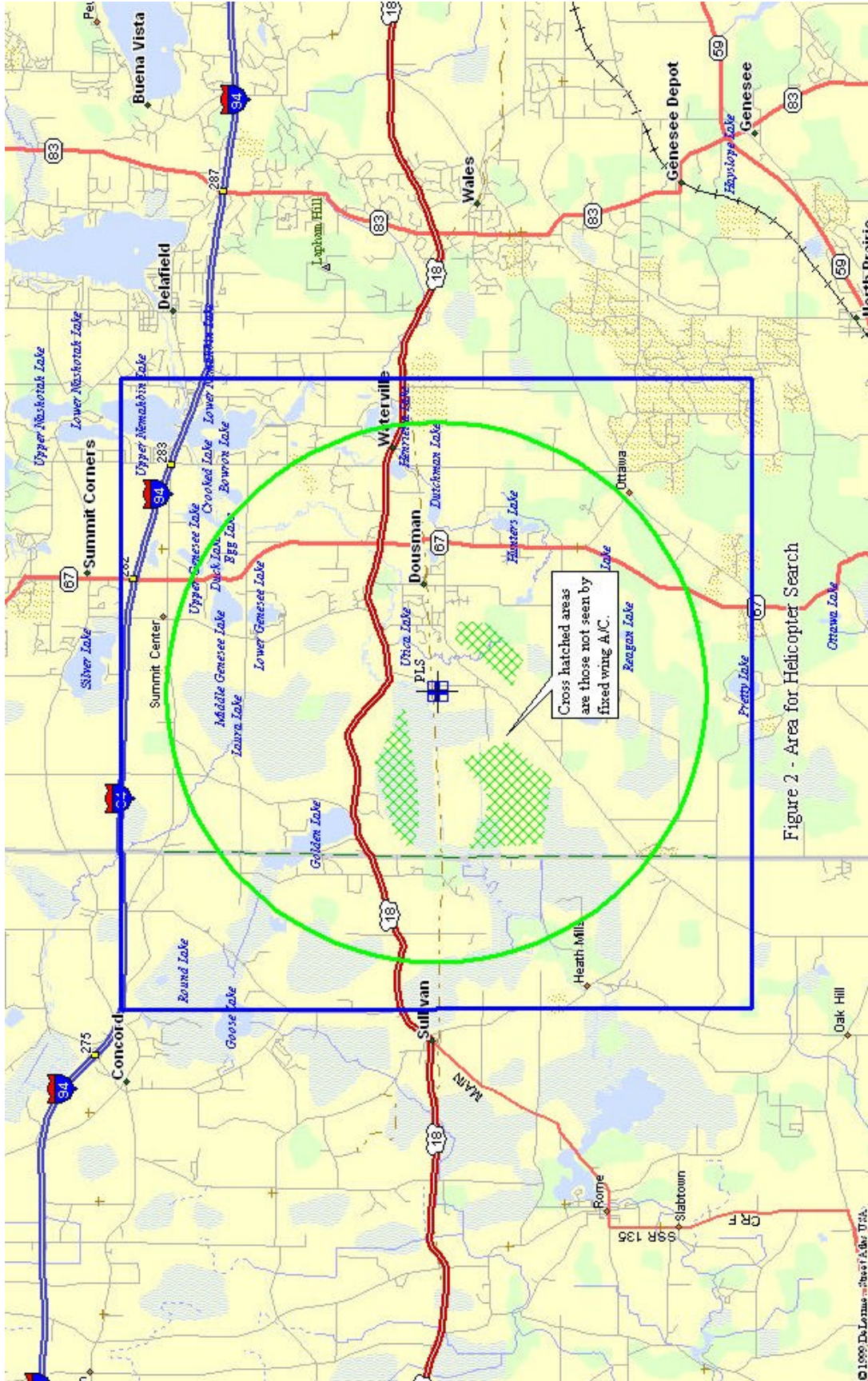


Figure 2 - Area for Helicopter Search

3.0 Support Requirements

In addition to the usual requirements for supporting a search and rescue mission, this approach adds some additional support considerations.

3.1 Headquarters

3.1.1 In addition to normal support equipment, the CAP headquarters must also have detailed maps of the search area and access to a photocopier. Or it must have mapping software, a computer, and (preferably) a color printer for producing search maps. The headquarters also needs a supply of highlighter pens for marking those maps. As well as normal CAP communications frequencies, the headquarters must be able to support a common helicopter/CAP coordination frequency.

3.1.2 Since the CAP headquarters is often located next to or in the supported agency's command post, the CAP search manager needs a method of getting marked maps to and from the airport from which the fixed wing aircraft is operating. This may be a shuttle vehicle to move the aircrew to and from the command post, a fax machine at the command post and the airport, or a remote air operations section located at the airport. If it is at the airport, the air operations section needs the map producing equipment. And the helicopter must also be based out of the airport instead of at a landing zone local to the search area.

3.2 Fixed Wing Aircraft

The fixed wing aircraft must support the common coordination frequency used for the search.

3.3 Helicopters

If possible, provide helicopters with an adequate landing zone near the search area. This maximizes the time spent searching. Helicopters also need a nearby airport with fuel, including jet fuel. If the helicopter will be used for rescue and evacuation, provide the crew with maps to or the GPS coordinates of the appropriate hospital or evacuation site.

4.0 Conclusion

By using fixed wing aircraft, helicopters, and ground searchers in a complimentary manner, the CAP search manager can perform an effective missing person search in a minimum amount of time.